Trend Study 13B-8-00

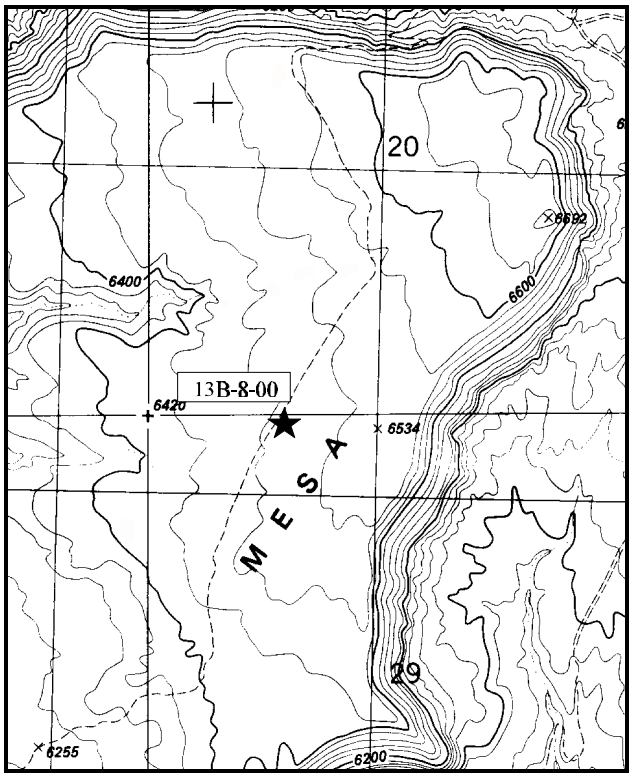
Study site name: Steamboat Mesa South . Range type: Big Sagebrush-Grass .

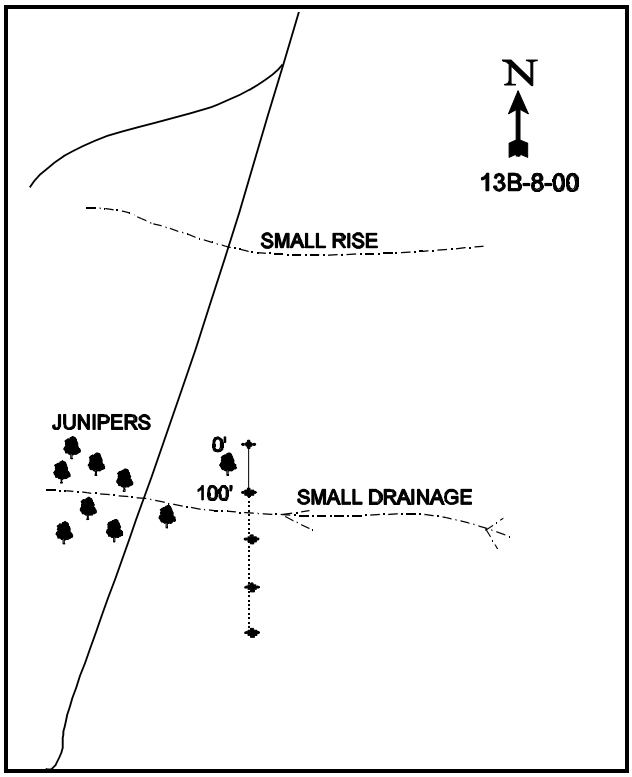
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Start from site number 13B-7-00, Steamboat Mesa North. Continue south on the same road for 0.6 miles to a fork. Proceed straight 0.2 miles (halfway to an exclosure) to a large Juniper in a sagebrush-grass flat. The baseline 0-foot stake (tag #7812) is located north of the tree.





Map Name: Steamboat Mesa Diagrammatic Sketch

Township 23S , Range 26E , Section 29 UTM 4294146.747 N, 666652.110 E

DISCUSSION

Trend Study No. 13B-8 (34-8)

Located approximately 3/4 miles south of transect 13B-7, the Steamboat Mesa South transect samples a habitat type dominated by native vegetation, although not in a completely natural condition. This open rolling site may be an example of a former sagebrush park undergoing a conversion to annual grass-sagebrush due to excessive livestock use in the past. A large exclosure is located to the south of the study. Two pellet group transects are also located on Steamboat Mesa. The lower elevation transect (6,300') shows an average of 27 deer days use/acre (67 ddu/ha) between 1986 and 1997. The pellet transect located at 6,700 feet, and closer to the this study, averaged 23 deer use days/acre (56 ddu/ha) for the same time period. A pellet group transect run parallel to the trend study baseline in 2000 estimates 86 deer days use/acre (212 ddu/ha) and 46 cow days use/acre (114 cdu/ha). All of the cattle and most of the deer use appears to be from the past winter ('99).

This area of the mesa is topographically an open park that slopes gently to the west with an elevation of 6,400 feet. The surface soil texture is a sandy clay loam with no rocks or pavement on the surface. Effective rooting depth is about 13 inches and soil reaction is neutral (pH 6.9). Low amounts of phosphorus (4.9ppm) and potassium (67.2ppm) could be a limiting factor for this site where 10ppm and 70ppm respectively are necessary for normal plant development and growth. As for all the other sites for this management unit, soil temperature is moderately high (62° F). Percent bare soil cover decreased from 1986 to 1995, now it has increased to over 40% with the exceptionally dry year in 2000. Vegetative cover and litter cover have both decreased. This helps illustrate the point that you cannot depend on annuals to provide consistent litter cover year to year.

Wyoming big sagebrush, the key browse species, currently ('00) has an estimated density of 2,480 plants/acre. The population appears vigorous with moderate to heavy use reported in 1986, mostly light use in 1995 and heavy use in 2000. Age class distribution is fairly stable with nearly the same proportion of young and mature with each reading. Only 2% of the population is decadent. Winterfat was also sampled on this site, but is in very low numbers, vigorous, and with no signs of utilization. Escape and thermal cover is found in scattered junipers along washes and ridgetops. Most of the trees have been highlined.

Cheatgrass was the most abundant grass accounting for 53% of the total vegetative cover in 1995 and was found in 95% of the quadrats. Currently ('00) this has turned completely around with cheatgrass only making up 11% of the total vegetative cover and quadrat frequency has gone down to 64%. The cheatgrass will provide some early spring forage, however now it does not pose a severe fire hazard as it did previously. Both needle and thread grass and mutton bluegrass significantly decreased in nested frequency between 1986 to 1995. In 2000, with the dry year and corresponding reduction in competition from cheatgrass, needle and thread grass has increased from less than 1% to more than 16% cover and quadrat frequency has risen sharply from 40% to 93%. It now provides 69% of the total herbaceous cover an increase from 3% in 1995. Galleta has remained stable while Indian ricegrass has decreased slightly. They still occur in relatively low densities. Forbs comprise 21% of the vegetative cover with nearly two-thirds being annual species in 1995. Currently annuals only make up 4% of the vegetative cover. Perennial forbs have also declined in frequency and cover since 1995. This illustrates the effect the dry year has had on forbs. Most of these forbs are small and not of much value for winter forage.

1986 APPARENT TREND ASSESSMENT

The soil appears stable with no signs of erosion on the study site. The vegetative trend appears generally stable in terms of succession, except for form and vigor of Wyoming big sagebrush. In the past there had been signs of sagebrush that had died, most likely from overuse and/or prolonged drought. A series of winters with constant snow cover and use by cattle could be very detrimental to the sagebrush population. Currently, the sagebrush appears healthy, but the stand density is low.

1995 TREND ASSESSMENT

The soil is adequately covered by both vegetation and litter. Both adequate ground cover and no signs of erosion indicate a stable soil trend. Grass cover is good, but most comes from undesirable annual species. Cheatgrass is abundant and contributes large quantities of fine fuel to the litter. Furthermore, 70% of the total herbaceous understory cover is contributed by annual species. Most forbs have little forage value, but do aid in soil stabilization. Because cheatgrass dominates the site, there is a high probability of losing the sagebrush population with a single wildfire event. The herbaceous understory trend for this site is considered downward because of the high percentage of annual species. Wyoming big sagebrush shows less utilization than in the past, exhibiting characteristics of a stable population. It has a good biotic potential of 10% and the young age class is at 46%. The winterfat population is also stable with no observable utilization. Thus, browse trend is considered stable.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - downward (1) because of the high percentage of annual species

2000 TREND ASSESSMENT

Percent bare soil has increased sharply since 1995 with it increasing from 15% to 44% with significant decreases in vegetative and litter cover. The ratio of bare soil to protective cover has also deteriorated downward from 1:3.5 to 1:2.3, also indicating a downward trend. In 1995 annuals contributed to 70% of the vegetative cover, where currently they only make up 13% of the vegetative cover. Another clear example of why annual vegetative and litter cover is not an adequate or dependable source of protective cover for the soil. The trend for soil is slightly downward. Grass cover is good, with most of it coming from perennial species. The forbs have little forage value and only make up 4% of the vegetative cover. Cheatgrass does not currently dominate the site, therefore it is not a high fire hazard is was in 1995. The herbaceous understory trend for this site is considered improving because of the increased values for perennial species and the decrease in the abundance of annual species. Wyoming big sagebrush shows continued moderate to heavy use, but it still exhibits characteristics of a stable healthy population. It has a fair to good biotic potential and the young age class makes up 50% of the population. The winterfat population is also stable with no observable utilization. Thus, browse trend is considered stable.

TREND ASSESSMENT
soil - slightly down (2)
browse - stable (3)
herbaceous understory - improving (4) because of the decrease of annual species and increase in perennial species

HERBACEOUS TRENDS --
Herd unit 13B, Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Agropyron cristatum	a-	b7	a-	-	3	-	.01	-
G	Bromus tectorum (a)	-	b341	a181	-	95	64	15.05	3.09
G	Hilaria jamesii	a17	b52	b52	7	22	21	.79	1.58
G	Oryzopsis hymenoides	6	20	7	2	7	3	.77	.21
G	Poa fendleriana	26	16	5	10	6	3	.05	.16
G	Poa secunda	a-	c117	b54	-	46	21	.65	.52
G	Sitanion hystrix	11	-	-	7	-	-	-	-
G	Sporobolus cryptandrus	b7	a-	c19	3	-	10	-	.81
G	Stipa comata	b257	a91	b260	90	40	93	.70	16.47
G	Vulpia octoflora (a)	-	b231	a6	-	70	3	1.08	.01
Total for Annual Grasses		0	572	187	0	165	67	16.14	3.11
Total for Perennial Grasses		324	303	397	119	124	151	2.99	19.77
Total for Grasses		324	875	584	119	289	218	19.14	22.88
F	Astragalus spp.	a-	b29	a-	-	15	-	.24	-
F	Carduus nutans (a)	-	b59	a-	-	28	-	.14	-
F	Cymopterus spp.	-	6	-	-	2	-	.01	-
F	Draba nemorosa (a)	-	a15	b51	-	5	22	.02	.16
F	Erodium cicutarium (a)	-	a-	b16	-	-	6	-	.03
F	Erigeron pumilus	a-	a-	b11	-	-	5	.00	.02
F	Gilia hutchinifolia (a)	-	b32	a2	-	16	1	.08	.00
F	Grindelia squarrosa	-	1	-	-	1	-	.00	-
F	Hedysarum spp.	-	6	-	-	2	-	.18	-
F	Lappula occidentalis (a)	-	b16	a-	-	7	-	.06	-
F	Lactuca serriola	a-	b30	a-	-	16	-	.08	-
F	Lepidium densiflorum (a)	-	b201	a-	-	68	-	.95	-
F	Leucelene ericoides	a-	b9	b10	-	4	3	.16	.33
F	Machaeranthera spp	a-	b10	a-	-	6	-	.03	-
F	Phlox hoodii	-	4	-	-	1	-	.03	-
F	Phlox longifolia	-	4	-	-	2	-	.01	-
F	Plantago patagonica (a)	-	b232	a64	-	67	25	2.34	.22
F	Polygonum douglasii (a)	-	2	-	-	1	-	.00	-
F	Ranunculus testiculatus (a)	-	3	-	-	1	-	.00	-
F	Schoencrambe linifolia	a-	b35	a-	-	16	-	.08	-
F	Sisymbrium altissimum (a)	-	b50	a-	-	25	-	.18	-
F	Sphaeralcea coccinea	c207	b108	a45	79	39	23	1.09	.34
F	Tragopogon dubius	c69	b21	-	29	11	-	.05	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
F	Trifolium spp.	-	2	-	-	1	-	.00	-
F	Unknown forb-perennial	$_{b}$15	$_{b}$24	$_{a}$-	6	8	-	.06	-
Total for Annual Forbs		0	610	133	0	218	54	3.80	0.41
Total for Perennial Forbs		291	289	66	114	124	31	2.05	0.69
Total for Forbs		291	899	199	114	342	85	5.86	1.11

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 13B, Study no: 8

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	40	45	1.53	2.34
B	Ceratoides lanata	2	2	-	-
B	Opuntia spp.	0	1	-	-
B	Pinus edulis	0	1	1.82	.98
Total for Browse		42	49	3.36	3.32

CANOPY COVER --
Herd unit 13B, Study no: 8

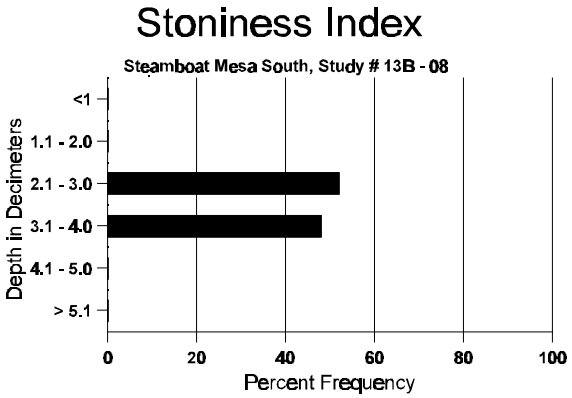
Species	Percent Cover '00
Juniperus osteosperma	3
Pinus edulis	1

BASIC COVER --
Herd unit 13B, Study no: 8

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	393	331	6.00	44.37	29.38
Rock	-	-	0	0	0
Pavement	-	-	0	0	0
Litter	400	369	67.00	60.84	51.45
Cryptogams	163	42	0	1.98	.86
Bare Ground	274	318	27.00	14.81	43.76

SOIL ANALYSIS DATA --
Herd Unit 13B, Study # 8, Study Name: Steamboat Mesa South

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
13.01	62.4 (14.57)	6.9	54.6	23.1	25.3	1.4	4.9	67.2	0.5



PELLET GROUP FREQUENCY --
Herd unit 13B, Study no: 8

Type	Quadrat Frequency '95	Quadrat Frequency '00	Pellet Transect: Pellet Groups per Acre '00	Pellet Transect: Days Use per Acre (ha) '00
Rabbit	5	41	174	N/A
Deer	18	33	1114	86 (212)
Cattle	21	17	548	46 (113)

BROWSE CHARACTERISTICS --
Herd unit 13B, Study no: 8

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	86	1	1	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	86	5	9	3	1	-	-	-	-	-	18	-	-	-	1200			18
	95	37	-	-	-	-	-	-	-	-	37	-	-	-	740			37
	00	25	16	20	1	-	-	-	-	-	62	-	-	-	1240			62
M	86	-	7	9	-	-	-	-	-	-	16	-	-	-	1066	17	12	16
	95	19	22	1	-	-	-	-	-	-	42	-	-	-	840	17	25	42
	00	7	18	34	-	-	-	-	-	-	59	-	-	-	1180	14	21	59
D	86	-	-	1	-	-	-	-	-	-	1	-	-	-	66			1
	95	2	-	-	-	-	-	-	-	-	-	-	-	2	40			2
	00	1	1	1	-	-	-	-	-	-	1	-	-	2	60			3
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	46%	37%	00%	-31%
'95	27%	01%	02%	+35%
'00	28%	44%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	2332	Dec:		3%
'95	1620			2%
'00	2480			2%

Ceratoides lanata																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	1	-	-	-	-	-	-	1	-	-	-	66	14	11	1
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11	16	1
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100	14	15	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	100%	00%	- 9%
'95	00%	00%	00%	+40%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'86	66	Dec:	-
'95	60		-
'00	100		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	28	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'95	0		-
	'00	0		-

Gutierrezia sarothrae																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'95	0		-
	'00	0		-

Opuntia spp.																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'95	0		-
	'00	20		-

Pinus edulis																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'95	0		-
	'00	20		-